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METHOD AND WIRELESS PACKET NETWORK FOR SETTING UP A COMMUNICATIONS CHANNEL

Abstract:

Abstract of WO 02069663

(A1) In a packet switched wireless communications network, a parameter of a communication channel request indicates that the communication channel is to be used to transfer call related control messages. Upon receipt of the communication channel request, a network element sends a request to a radio access network that a part of the communication channel should be set-up to transfer call related control messages. Another network element sets filtering information to allow only specific messages to be transferred on the communication channel. Specifically, the filtering information is set such that only call related control messages may be transferred on the communication channel. The other network element then sends the filtering information to the user equipment (UE). The UE derives the uplink filtering information from the received filtering information.

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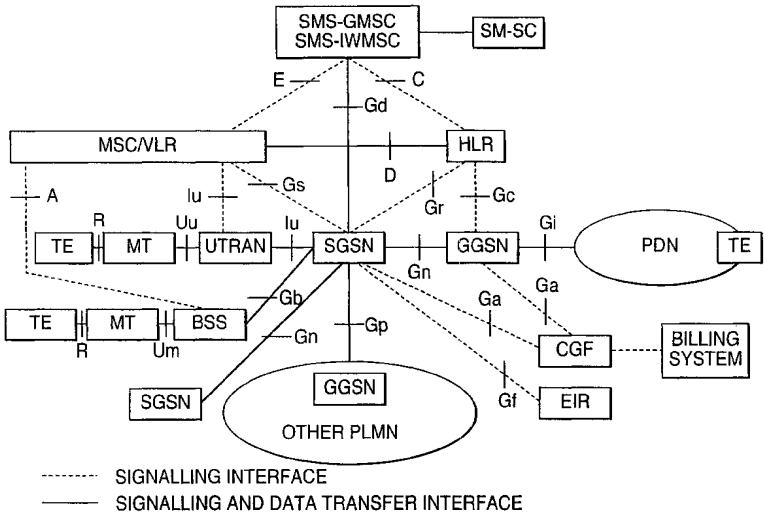

(57) Abstract: In a packet switched wireless communications network, a parameter of a communication channel request indicates that the communication channel is to be used to transfer call related control messages. Upon receipt of the communication channel request, a network element sends a request to a radio access network that a part of the communication channel should be set-up to transfer call related control messages. Another network element sets filtering information to allow only specific messages to be transferred on the communication channel. Specifically, the filtering information is set such that only call related control messages may be transferred on the communication channel. The other network element then sends the filtering information to the user equipment (UE). The UE derives the uplink filtering information from the received filtering information.

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METHOD AND WIRELESS PACKET NETWORK FOR SETTING UP A COMMUNICATIONS CHANNEL

BACKGROUND

Field of the Invention

This invention relates generally to methods and systems providing telephony communications through a packet switched wireless network. A particular aspect of the invention relates to methods of transferring call related control messages in a packet switched wireless network.

Description of the Related Art

In general, packet switched wireless networks provide communications for mobile terminals with no physical connection required for network access. The General Packet Radio Service (GPRS) in the Global System for Mobile Communications (GSM) and the Universal Mobile Terrestrial System (UMTS) have both been developed to provide wireless communications networks with a packet switched side as well as a circuit switched side.

The specifications for a UMTS network with further improvements have been released by the 3rd Generation Partnership Project (www.3gpp.org). Release 99 of the UMTS specifications provides that a network subscriber can have one or more packet data protocol (PDP) addresses. Each PDP address is described by

one or more PDP contexts in the Mobile Station (MS), the Service GPRS Service Node (SGSN), and the Gateway GPRS Service Node (GGSN). A GGSN is a gateway to an external network. Each PDP context may have forwarding and mapping information for directing the transfer of data to and from its associated PDP address and a traffic flow template (TFT) for filtering the transferred data.

Each PDP context can be selectively and independently activated, modified and deactivated. The activation state of a PDP context indicates whether or not data transfer is enabled for a corresponding PDP address and TFT. If all PDP contexts associated with the same PDP address are inactive or deactivated, then all data transfer for that PDP address is disabled. All PDP contexts of a subscriber are associated with the same Mobility Management (MM) context for the International Mobile Subscriber Identity (IMSI) of that subscriber.

An example of the PDP context activation procedure in Release 99 of the UMTS specifications is shown in Fig. 2. As known from the specifications, the PDP context activation procedure is slightly different depending on whether it is the first PDP context activation procedure for a particular PDP address or a subsequent PDP context activation procedure (called " secondary" PDP contexts).

The activate PDP context request message sent in step 1 of Fig. 2 includes a number of parameters. The parameters include a PDP address and an Access Point Name (APN). The PDP address is

used to indicate whether a static PDP or dynamic PDP address is required. The APN is a logical name referring to the Gateway GPSR Support Node (GGSN) to be used. In step 3, the SGSN sends a Radio Access Bearer (RAB) setup message to the UMTS Terrestrial Radio Access Network (UTRAN). In step 4, the SGSN sends a Create PDP Context Request message to the affected GGSN. The GGSN decides whether to accept or reject the request, If it accepts the request, it modifies its PDP context table and returns a Create PDP Context Response message. The SGSN then sends an Activate PDP Context Accept message to the User Equipment (UE) in step 5.

Despite the detailed specifications provided for packet routing and PDP context in Release 99 of UMTS, it does not provide for certain telephone calls which may need to be handled in a particular manner. For example, emergency 911 calls are to be routed to a public safety answering point (PSAP) without cost to the calling party even if the calling party is roaming beyond their home area. Because of their packet oriented nature, UMTS and other recently developed packet switched wireless communications networks have problems identifying such types of calls and treating them appropriately while simultaneously guarding against abuse or fraud.

BRIEF SUMMARY OF THE EXAMPLE EMBODIMENTS

The present invention addresses packet switched wireless communications networks which are disadvantageous for at least the above reasons. In particular, one of the key problems solved by the invention is the transfer of call related control messages. The invention provides a method of setting a communication channel in order to transfer call related control messages.

More particularly, the example embodiments of the invention described in detail below are an efficient way to reuse or adapt the PDP context activation and the secondary PDP context activation procedure in UMTS and other networks for signalling to transfer call related control messages rather than for transferring data packets. The resulting " signalling PDP context" is preferably used to transfer call related control messages and specifically call control messages. It also makes it possible, but does not require, that the call related control messages can be transferred free of charge.

In exemplary, non-limiting, embodiments of the invention, the access point name (APN) parameter of a packet data protocol (PDP) context request is used for transferring call related control messages. A serving GPRS service node (SGSN) informs a Radio Access Network (RAN) that a Radio Access Bearer (RAB) for the signalling PDP context should be setup. The SGSN indicates in the RAB setup request message that call related control messages will be transferred on the RAB. According to the

indication, a radio bearer for the signalling PDP context in the RAN can be allocated. If the option of transferring the call related control messages free of charge is elected, then the SGSN sets the charging characteristics of the PDP context accordingly. A gateway GPRS service node (GGSN) sets a Traffic Flow Template (TFT) to allow only specific messages to be transferred on the PDP context. Specifically, the TFT is set such that only call related control messages may be transferred on the PDP context. TFT thus acts as filtering information. The GGSN then sends the TFT to the SGSN and the SGSN forwards the TFT to the User Equipment (UE). The UE derives the uplink TFT from the received TFT. This improves the security so that only predefined messages can be sent by the UE.

Another embodiment is to allow the UE to set the filtering information, for example the TFT, so that only call related control messages can be sent on the PDP context. Since UE is not a trusted element, there is a possibility that the UE sets unauthorized filtering information, for example TFT, and there is thus a possibility of fraud. In this embodiment, the GGSN has to validate the filtering information, for example the TFT.

BRIEF DESCRIPTION OF THE DRAWINGS

The foregoing and a better understanding of the present invention will become apparent from the following detailed description of example embodiments and the claims when read in

connection with the accompanying drawings, all forming a part of the disclosure of the invention. While the foregoing and following written and illustrated disclosure focuses on disclosing example embodiments of the invention, it should be clearly understood that the same is by way of illustration and example only and is not to be taken by way of limitation, the spirit and scope of the present invention being limited only by the terms of the claims in the patent issuing from this application.

Fig. 1 is a generalized block diagram of the architecture of a packet switched wireless communications network in which the example embodiments of the invention may be practiced.

Fig. 2 is a generalized signalling flow diagram illustrating an example PDP context activation procedure.

Fig. 3 is a generalized signalling flow diagram illustrating the example embodiments of the invention transferring call related control messages.

DETAILED DESCRIPTION

The exemplary embodiments of the present invention seek to provide a method of activating a signaling PDP context to transfer call related control messages in a packet switched wireless communications network. These exemplary embodiments of the invention can be utilized in a large number and variety of application level operations since such application level

operations will typically require a signalling PDP context. The present invention of course is not limited to these exemplary embodiments. It is more broadly directed to various methods of activating a signalling PDP context as indicated by the appended claims.

An example of a network architecture supporting these specifications is the wireless communications network shown in the block diagram of Fig. 1. The various elements of the network and their functions may, but need not, be those described in the General Packet Radio Service (GPRS) Service Description, Stage 2, 3G TS 23.060, Version 3.2.1, published by the 3rd Generation Partnership Project (www.3gpp.org) and which is hereby incorporated by reference. The elements and their functions may instead be those described in an earlier or later version of the 3G TS 23.060 specifications or may be those of any other known packet switched wireless communications network. The description of network elements and their functions hereby incorporated by reference is merely a non-limiting example of packet switched wireless communication networks.

Several elements of the example network illustrated in Fig. 1 are particularly relevant to this invention. The Mobile Terminal (MT), commonly referred to as a cell phone or mobile phone, is only one possible part of User Equipment (UE). Typically, Terminal Equipment (CTE) used together with a Mobile Terminal (MT) constitutes User Equipment (UE). Any UE may be

utilized in conjunction with this invention so that it operates or can be programmed to operate in the manner described below. The UMTS Terrestrial Radio Access Network (UTRAN), and the Base Station System (BSS) in GPRS, manage and control the radio access between the network and a number of UEs.

The Serving GPRS Support Node (SGSN) is the node that serves the UE. At PDP Context Activation, the SGSN establishes a PDP context used for data forwarding purposes. The Gateway GPRS Support Node (GGSN) is the node accessed by the packet data network due to evaluation of the PDP address. It contains routing information for attached GPRS users.. The routing information is used to tunnel Protocol Data Units (PDUs) to the SGSN. The SGSN and GGSN functionalities or they may reside in different physical nodes or they may be combined in the same physical node, for example, an Internet GPRS Support Node (IGSN).

Fig. 3 shows a signalling flow diagram illustrating the example embodiments of the invention activating a signaling PDP context to transfer call related control messages between User Equipment (UE), the UMTS Terrestrial Radio Access Network (UTRAN), Serving GPRS Support Node (SGSN), and Gateway GPRS Support Node (GGSN). The embodiments may utilize either the initial PDP context activation procedure for a particular PDP address or a subsequent (secondary) PDP context activation procedure for the PDP address. Although there are some similarities, the initial PDP context activation procedure and

the secondary PDP context activation procedure differ from each other. Furthermore, the signalling PDP context can be activated in advance (i.e., before it is known whether there are any call related control messages to be transferred). In these example embodiments, the activated PDP context is used specifically and exclusively to transfer call related control messages.

At step 1 of Fig. 3, the User Equipment (preferably including a mobile terminal) initiates a request to activate a primary or a secondary PDP context for signalling. The activation request may or may not be the result of actions taken by the user or other events occuring at the application of the user equipment (UE). The activation request may also be initiated by other elements of the network. However, step 1 of Fig. 3 differs from the activate PDP context request in Fig. 2 insofar as it requests a PDP context for transferring call related control messages and does not request a PDP context used for transferring packet data. It also differs insofar as the APN provides the indication that the PDP context is a signalling PDP context and is not used in its conventional manner as a parameter which is a logical name referring to the GGSN to be used. According to a further embodiment, the UE may set the filtering information, for example TFT, for the PDP context.

At step 2, the Service GPRS Service Node (SGSN) sends the information that the PDP context is a signalling PDP context to a Radio Access Network (RAN), preferably the UMTS Terrestial Radio

Access Network (UTRAN). The UTRAN manages a number of channels for communication with the UE and sets up a radio access bearer (RAB) for the PDP context which will be used to transfer call related control messages. The example embodiments shown in Fig. 3 differ from the conventional PDP context activation procedures at least insofar as the SGSN informs the UTRAN that the PDP context is a signaling PDP context.

At step 3, the SGSN sends a Create PDP Context Request, including the special APN indicating that the PDP context is a signaling PDP context, to the Gateway GPRS Service Node (GGSN). In one example embodiment, the SGSN sets the charging characteristics of the PDP context as " free of charge" if it is desired that transferring of call related control messages will not be charged by the network Billing System.

In response to step 3, GGSN sometimes sets a Traffic Flow Template (TFT) for the requested signalling PDP context. In an example embodiment where the call related control messages will not be charged, the GGSN sets the Traffic Flow Template (TFT) of the PDP context such that only call related control messages are accepted to be transferred on the PDP context. This TFT is set such that only call related control messages may be transferred on the PDP context and is used to filter downlink packets in the GGSN. In the GGSN setting the TFT is optional. It ensures that only data packets according to the TFT are allowed to be transferred on the requested PDP context and prevents

transferring other data on the PDP context free of charge. This embodiment also differs from the conventional PDP context activation procedure in which the UE sets the TFT. However, in a further embodiment of the invention, in which the TFT is set by the UE for the PDP context, the GGSN has to validate the TFT set by the UE. The GGSN then monitors, if the TFT set by the UE is in accordance with the criteria that only call control related messages are allowed to be transferred on that particular PDP context. The GGSN thus monitors data over the PDP context. In case of detecting an unauthorized data transmission over the communication channel, the GGSN blocks the data from transfer over said communication channel.

In step 4, the GGSN acknowledges the request and sends the TFT to the SGSN in a Create PDP Context Response message. The GGSN may include the address of an entity handling calls to the Create PDP Context Response message. Of course, in a network having an IGSN instead of a GGSN and a SGSN, the IGSN carries out steps 3, 4 and 5.

In step 5, the SGSN acknowledges the Activate (Secondary) PDP Context Request message and copies the TFT and the address of the entity handling calls to the UE in an Activate (Secondary) PDP Context Accept message. The UE then derives the uplink TFT from the received TFT.

Step 6 shows the end result of the example embodiments: that call related control messages can be easily sent by the UE on the created PDP context.

While the foregoing has described what are considered to be example embodiments of the invention, it is understood that various modifications may be made therein and that the invention may be implemented in various forms and embodiments, and that it may be applied in numerous applications, only some of which have been described herein. It is intended by the following claims to claim all such modifications and variations.

CLAIMS

1. A method of setting up a communication channel for transferring call related control messages in a packet switched wireless communications network, the method comprising the steps of:

sending, from a first network element to a second network element, a request to setup a communication channel, said request having an indication indicating that the communication channel will be used for transferring call related control messages to or from said first network element.

2. The method recited in claim 1, further comprising the step of sending, from said second network element to a radio access network, a request to setup part of the communication channel, said request indicating that said part of the communication channel will be used for transferring call related control messages.

3. A method of claim 1, wherein said request includes a parameter which indicates whether or not said

communication channel request will be used to transfer call related control messages.

4. The method recited in claim 3, wherein said first network element generates said request and includes said parameter in said request.

5. The method recited in claim 1, comprising a further step of setting filtering information for said communication channel in response to receiving an indication that the communication channel will be used for transferring call related control messages.

6. The method recited in claim 5, comprising the further step of transferring a call related control message to or from said first network element, said call related control message being filtered according to said filtering information.

7. The method recited in claim 1, further comprising the step of sending, from said second network element, the said indication, that the communication channel will be used for transferring call control messages, to a third network element.

8. The method recited in claim 5, wherein the first network element sets said filtering information.

9. The method recited in claim 8, wherein the first network element filters uplink data traffic using said filtering information.

10. A method recited in claim 7, wherein the said third network element monitors the data sent on the said communication channel and blocks from transfer in said communication channel if the data is not call related control messages.

11. A method recited in claim 8, wherein a third network element validates the data sent on the said communication channel and blocks from transfer in said communication channel if the data is not call related control messages.

12. A method recited in claims 5 and 7, wherein the said third network element sets the said filtering information in response to receiving the indication, that the communication channel will be used for transferring call control messages.

13. The method recited in claim 1, further comprising the step of returning an accept message from said second network element to said first network element, said accept message acknowledging said request and providing the address of an entity handling said call.

14. The method recited in claim 5 ,wherein a data unit is filtered according to said filtering information and is blocked from transfer in said communication channel if it is not a call related control message

15. The method recited in claim 1, wherein the radio access network sets up part of the communication channel.

16. The method of claim 1, wherein said first network element is a mobile station

17. The method of claim 5, wherein uplink data traffic from the mobile station is filtered according to said filtering information.

18. The method of claim 7, wherein, said third network element sets filtering information in response to set up said communication channel.

19. The method recited in claim 7, wherein the third network element sends said filtering information to said second network element.

20. The method recited in claim 9, wherein said second network element forwards said filtering information to the first network element which filters uplink data traffic using said filtering information.

21. The method recited in claim 5, wherein said filtering information is a Traffic Flow Template (TFT).

22. The method recited in claim 1, wherein said communication channel is a PDP context and the

indication is an access point name parameter in an Activate PDP Context Request.

23. The method recited in claim 1, wherein the request to set up a communication channel comprises an Activate PDP Context Request.

24. The method recited in claim 1, wherein the request to set up a communication channel comprises an Activate Secondary PDP Context Request.

25. A method for use in a wireless communications network in which data packets are transferred through the network on a communication channel, said method comprising the steps of:

sending a request message to setup said communication channel from a mobile terminal to the network, and

including, in said request message, a parameter which indicates whether or not said communication channel request will be used to transfer call related control messages.

26. The method recited in claim 25, wherein said mobile station generates said request message and includes said parameter in said request message.

27. The method recited in claim 25, wherein the method further includes the steps of generating an accept message which includes filtering information.

28. The method recited in claim 25, wherein the mobile station receives said accept message and filters uplink data traffic using said filtering information.

29. The method recited in claim 1, comprising the further step of returning an accept message from said second network element to said first network element, said accept message acknowledging said request and including filtering information.

30. The method recited in claim 7, wherein the second network element is a serving GPRS support node (SGSN) and the third network element is a gateway GPRS support node (GGSN).

31. The method recited in claim 1, wherein the call related control message comprises a call control message.

32. A packet switched wireless communication network, comprising

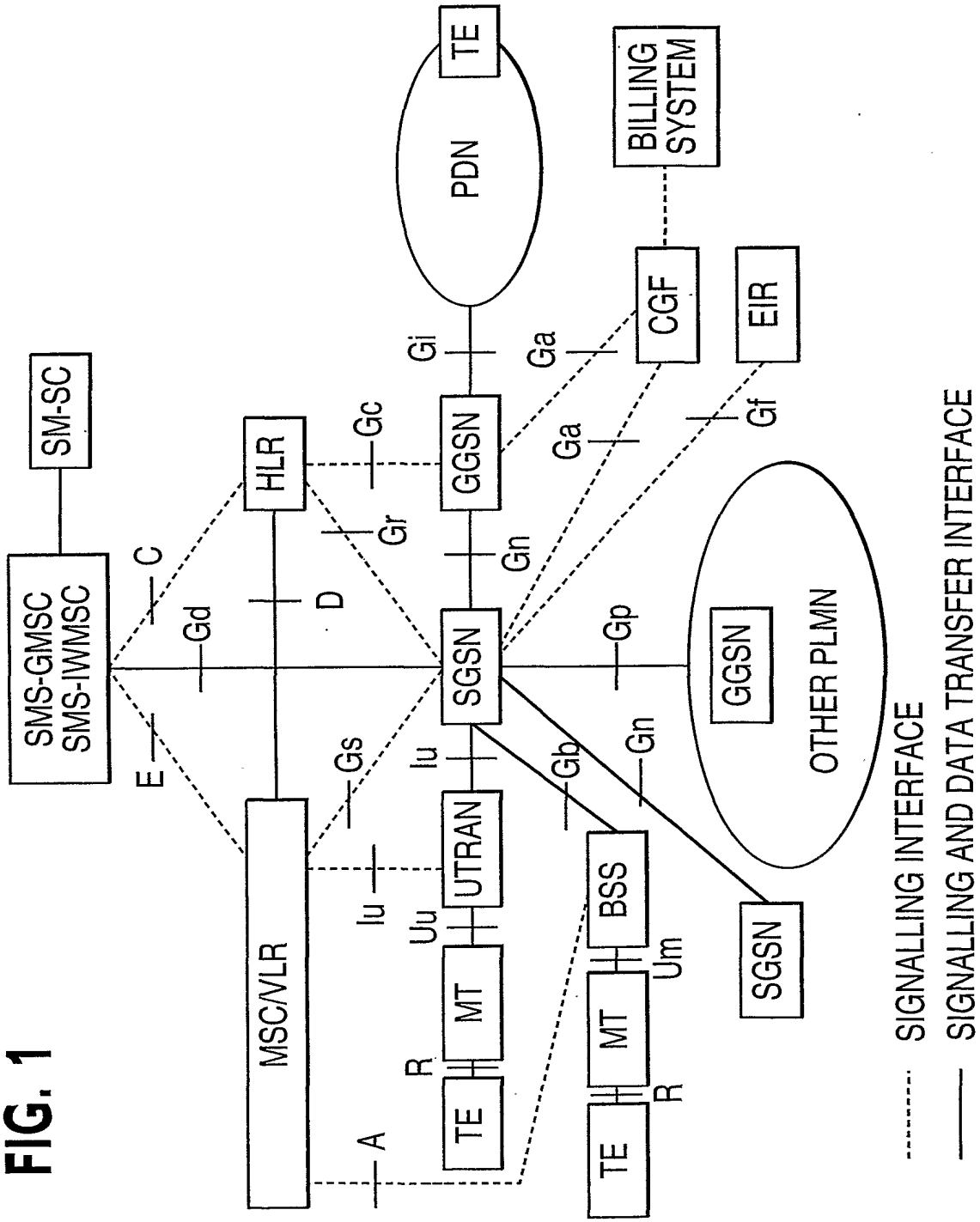
a first network element;

a second network element, said first network element sending a request to setup a communication channel to said second network element having an indication indicating that the communication channel will be used for transferring call related control messages to or from said first network element; and

a radio access network, said second network element sending a request to setup part of the communication channel to said radio access network, said request indicating that the communication channel will be used for transferring call related control messages.

33. A packet switched wireless communication network as recited in claim 32, wherein said first network element is a mobile terminal and said second network element is a serving GPRS support node (SGSN).

34. A packet switched wireless communication network as recited in claim 32, wherein said second network element is an Internet GPRS Support Node (IGSN).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GGSN
OTHER PLMN
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Iu
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Gn
MSC/VLR
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SIGNALLING INTERFACE
SIGNALLING AND DATA TRANSFER INTERFACE

FIG. 1

FIG. 2

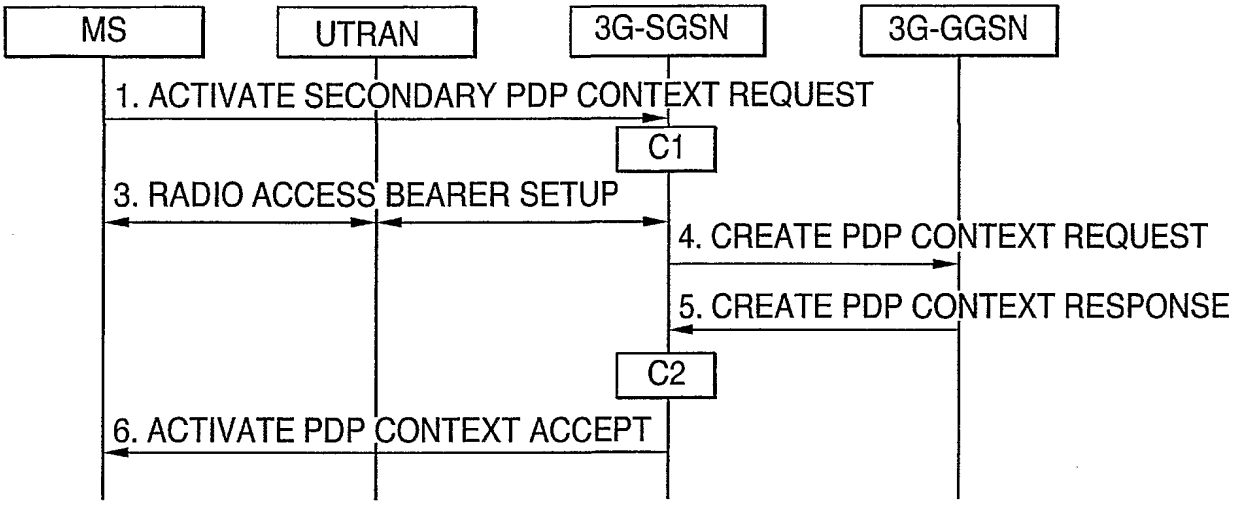
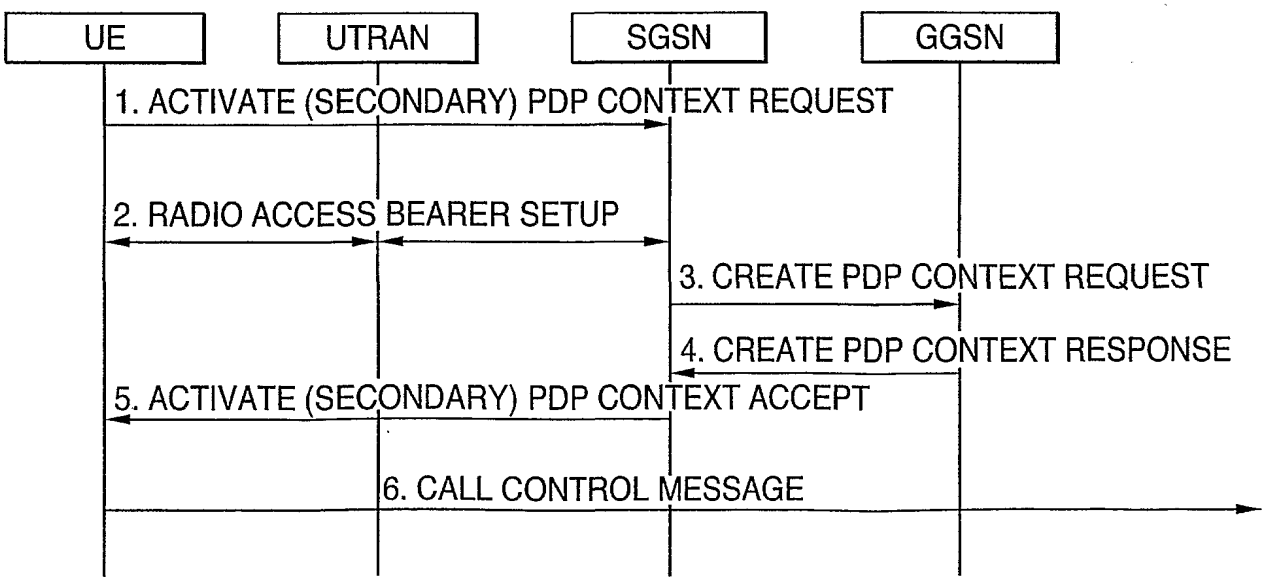

MS
UTRAN
3G-SGSN
3G-GGSN
1. ACTIVATE SECONDARY PDP CONTEXT REQUEST
C1
3. RADIO ACCESS BEARER SETUP
4. CREATE PDP CONTEXT REQUEST
5. CREATE PDP CONTEXT RESPONSE
C2
6. ACTIVATE PDP CONTEXT ACCEPT

FIG. 3


UE
UTRAN
SGSN
GGSN
1. ACTIVATE (SECONDARY) PDP CONTEXT REQUEST
2. RADIO ACCESS BEARER SETUP
3. CREATE PDP CONTEXT REQUEST
4. CREATE PDP CONTEXT RESPONSE
5. ACTIVATE (SECONDARY) PDP CONTEXT ACCEPT
6. CALL CONTROL MESSAGE

INTERNATIONAL SEARCH REPORT

International Application No
/IB 01/00595

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 H04Q7/38

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 H04Q H04L

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 99 05828 A (ERICSSON TELEFON AB L M) 4 February 1999 (1999-02-04) page 6, line 25 -page 7, line 7 page 15, line 1 -page 16, line 10	1-4,7, 13,16, 22-26, 30-34
X	DE 197 48 231 A (CIT ALCATEL) 6 May 1999 (1999-05-06) column 1, line 52 -column 2, line 4 column 5, line 33 - line 40 column 6, line 2 - line 7	1,2,7, 15,16, 32,33
A	EP 0 789 498 A (FORD MOTOR CO) 13 August 1997 (1997-08-13) column 1, line 44 -column 2, line 24	5,28

☐ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

° Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

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Date of the actual completion of the international search	Date of mailing of the international search report
7 November 2001	15/11/2001

Name and mailing address of the ISA	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL – 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Palencia Gutiérrez,C

Form PCT/ISA/210 (second sheet) (July 1992)

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/IB 01/00595

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 9905828 A	04-02-1999	AU 8369898 A	16-02-1999
		BR 9810796 A	25-07-2000
		CN 1271488 T	25-10-2000
		EP 0997018 A1	03-05-2000
		WO 9905828 A1	04-02-1999
DE 19748231 A	06-05-1999	DE 19748231 A1	06-05-1999
EP 0789498 A	13-08-1997	US 5890061 A	30-03-1999
		CA 2196939 A1	10-08-1997
		EP 0789498 A2	13-08-1997
		JP 9233562 A	05-09-1997